

XV. *On the Characters and Relationships of the less-known groups of Lamellicorn Coleoptera, with descriptions of new species of Hybosorinae, etc.* By GILBERT J. ARROW, F.E.S.

[Read October 6th, 1909.]

IN the *Lamellicornia*, as in other groups of animals, the forms which throw most light upon the problems of origin and phylogeny are those which are least numerous and obtrusive, and which, unless they happen to be individually rare, have no special attraction for the general collector. The super-family *Lamellicornia* is so multitudinous, and contains such an abundance of forms which attract attention by their beauty, size, or strangeness of aspect, that the groups in which these qualities are deficient have been very generally neglected, and the classification of some of the most primitive and interesting families has remained practically unstudied since Erichson, in 1848, published the most important contribution which has been made to the subject of Lamellicorn classification.

Erichson's division of all the *Scarabaeidae* into two great series, according as the posterior abdominal spiracles are situated in the dorsal part of the ventral segments (*Pleurosticti*) or in the membranes connecting the dorsal and ventral segments (*Laparosticti*), has been universally adopted, although his criterion has never been actually applied to some of the minor groups, and the position and relations of several have been accepted as they were assigned by him, although it is precisely in regard to these that the scheme detailed in his "Insecten Deutschlands" was least carefully elaborated. Some of the groups do not belong to the German fauna, and in any case the forms known to Erichson were so few that it was not possible to ascertain what features were fixed and fundamental, and what characteristic only of species or genera. In endeavouring to distinguish these groups by reference to the formulae devised by Erichson and adopted by his successors, I have found these formulae of little use and have been obliged to investigate their mutual relation-

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ships anew, by means of the much larger materials now available.

The division of the *Scarabaeidae* into *Laparosticti* and *Pleurosticti* according to the situation of the spiracles, although useful, does not correspond to any sharp natural line of cleavage. There are not only two, but several types, which pass one into the other, so that the point selected for the line of division must be more or less arbitrary, and if fixed with reference to this single character alone may be quite unnatural. It has long been recognized that the *Laparostict* type is normally accompanied by a more primitive condition of the labium, which has a free bilobed ligula, while in the *Pleurosticts* the ligula is indistinguishable, or almost indistinguishable, from the mentum. This is a test sometimes difficult to apply, and of little use in the case of those genera in which the organs of the mouth are partially atrophied. A more obvious distinction, and one which seems to me to be of some significance, is found in the conformation of the hinder part of the abdomen. In typical *Pleurosticts* this is large, highly chitinous and rigid above, but in *Laparosticts* it is less bulky, the dorsal part is scarcely chitinized, and, except in the most highly specialized groups (*e. g.* the *Coprinae*), not at all rigid. In all *Lamellicornia* the last dorsal segment is very strongly chitinized, and in the *Pleurostict* sub-families the one preceding it is closely connected with it, large, rigid and continuous at the sides with the penultimate ventral segment, forming a solid ring, in which the last spiracle is situated. In the *Laparosticts* this segment is not completely rigid, or if it is so is not continuous with the corresponding ventral segment.

Certain insects of peculiar conformation, the most important of which are the *Glaphyrinae*, have been attached by some systematists to one and by others to the other of these great divisions. In the case of the *Glaphyrinae* there has been a general agreement since Erichson to treat them as *Laparosticts*, but Leconte and Horn in their *Coleoptera of North America* compromised matters by placing a very large portion of the *Lamellicornia* in an intermediate third division called *Melolonthinae*, which he divided into *Laparostict Melolonthinae* and *Pleurostict Melolonthinae*, the former consisting of the *Glaphyrini* and another little anomalous group, the

Oncerini. It is strange that the actual location of the abdominal spiracles in the *Glaphyrinae* appears never to have been really observed, for it is of a unique type which contradicts all the suggested affinities of the insects in question. The abdomen is bulky, and the propygidium forms with the penultimate ventral segment a complete horny ring, in the dorsal part of which a spiracle is placed; but this spiracle is not the last, for, quite contrary to rule, another is found on each side of the last dorsal segment near, but a little distant from, the anterior angle. This curious fact appears to me to indicate that this tergite is not the homologue of the pygidium of all other *Lamellicornia*, but rather of the penultimate tergite, for the spiracle is not an additional one, the total number being the normal one of six. According to Lacordaire, the *Lamellicornia* possess seven abdominal spiracles, but the first of these is found in the membrane connecting the abdomen and metathorax, and is almost always different from, and not placed in line with, the other six. I therefore prefer to consider that as a metathoracic spiracle and to count six as belonging to the abdominal segments. Of these the pygidial spiracle of the *Glaphyrinae* forms the sixth, the preceding one is situated in the dorsal part of the penultimate segment, and the four anterior ones I have found in *Amphicoma vulpes* in the membrane connecting dorsal and ventral plates, and in *Amphicoma papaveris* in the dorsal plates themselves. As these two species are undoubtedly very nearly related the difference is evidently here of little significance. The position of the last two spiracles and their complete exposure indicate that the *Glaphyrinae* have a nearer relationship to the Pleurostictids than to the Laparostictids, but the remarkable peculiarity described places them in a very isolated position.

The *Oncerini*, associated with the above group by Leconte and Horn, consist of three or four minute species, of which *Chnarranthus* is the principal genus, and the only one of the three described which is known to me. This was placed by Lacordaire among the *Melolonthinae* together with the European *Chasmatopterus*, and I can discover no reason at all for Leconte and Horn's view. The abdomen is of the normal Pleurostict type, although the ventral segments, except the last, are completely consolidated. The spiracles are very difficult to see owing to their very small size, but by microscopical.

preparations I have ascertained that they also are in the normal situation for the *Melolonthinae*, i.e. the three posterior are in the dorsal part of the ventral segments, the sutures of which in this part are still visible.

Two peculiar genera, *Aelopus* and *Phaenognatha*, were placed by Erichson in the *Glaphyridae*, but removed to the *Melolonthinae* by Lacordaire on the ground that the situation of the spiracles is of the Pleurostict type. By a preparation of the abdomen of *Aelopus brunneus*, I found the spiracles to be completely Laparostict; but, in a paper published since the present one took shape, Dr. Ohaus (Deutsche ent. Zeits., 1909, p. 427) has made the highly interesting announcement that, while this is so in the male, in the female the four last spiracles are actually situated in the chitin of the ventral segments; that is, the species is Pleurostict in this sex. All the examples of *Phaenognatha* and *Aelopus* hitherto described are males, although Burmeister incorrectly considered both sexes to be represented among the specimens of *Aelopus* he described, and Lacordaire's account shows that, in spite of his statement as to the spiracles, he knew only the male. The female is wingless and clumsily built, and there is little doubt that this is the case in both genera, and that, as in *Pachypus*, all the females are very retiring and inert. Dr. Heller considers the group to be rather closely related to *Pachypus*; but although I believe all agree in being near the primitive Lamellicorn stock, it is likely that the resemblance is in part due to similarity in the mode of life. There are wide differences in the structure of the antennae and head, and the greatly exerted labium and mandibles connect the *Aelopinae* with the *Geotrupinae* and allied groups. There is certainly no special affinity with either the *Glaphyrinae* or *Melolonthinae*, and the propriety of regarding them as an independent and rather isolated sub-family can hardly be questioned.

An interesting feature of the genus *Aelopus*, and, no doubt, a primitive one, is the existence of apparently sensory hairs upon the dorsal surface of the prothorax. This is perfectly free from hairs, except for one or two long ones standing upright on each side and arising from a couple of small pits, one on each side of the middle. These pits are always visible, even when in roughly-used specimens the hairs have been lost. Somewhat similar hairs are found on the head or thorax in certain *Carabidae*

Phytophaga, etc., but so far as I know they are not found in any other *Lamellicornia*.

The distribution of the *Aclopinæ* is exceedingly interesting. Until recently only three species have been recognized, but although difficult to distinguish they will have to be considerably multiplied. *Aclopus* is peculiar to South America, while *Phaenognatha* consists of various Australian species (all but one of them described later in the present paper), and one or more from South America so closely related to them as to be quite fittingly placed in the same genus.

The proper systematic position of the remarkable Californian genus *Pleocoma* has been the subject of a prolonged controversy, and its structure has been pretty thoroughly investigated. Leconte and Horn claimed it as an undoubted Laparostict allied to the *Geotrupinæ*; while Gerstaecker placed it with equal confidence in the *Pleurosticti* near *Pachyppus*. The latter writer was wrong in declaring the spiracles to be situated in the chitinous rings; but I believe his view of the affinities of the genus was not altogether unjustified, and that although the two theories quoted above appear quite irreconcilable, it is not necessary to entirely reject either. I believe both *Pleocoma* and *Pachyppus* to be among those ancient survivals which are destructive of all clear-cut systems, but which throw most valuable light upon phylogeny. Dr. Horn has himself pointed out that *Pleocoma* has the spiracles so placed as to make it doubtful whether it is Laparostict or not. They are indeed surrounded by membrane, but so placed as to appear as though this encroached upon the horny segments. Both *Pleocoma* and *Pachyppus* have the very un-Melolonthine feature of possessing a horn in the male sex, the former upon the head and the latter upon the thorax; but both have also the entirely Melolonthine characteristic of a many-leaved antennal club. The number of joints in the club is invariably three in the whole of the *Scarabaeidae*, except in many *Melolonthinæ* and these two genera. On the other hand, *Pleocoma* appears to have very little in common with the *Geotrupinæ*, except the total number of eleven joints to the antenna, which if there were any similarity in these organs themselves would certainly be a very important fact, for this number of joints, general in other Coleoptera, occurs in no other *Lamellicornia* so far as

is known. It is remarkable that, while the Laparostict condition must certainly be regarded as more primitive than the Pleurostict, all the least primitive forms of the antenna are found in the Laparostict division, and one of the most highly modified types of all (*Lethrus*) occurs in the family in which alone (except in *Pleocomma*) the primitive number of eleven joints still exists.

It is interesting to find the habits of *Pleocomma* practically identical with those of *Pachypus*, the females of both being wingless and remaining always below the surface of the ground, where they are sought out by beevies of males. *Clitopa* and other *Melolonthine* genera have similar habits, but there is no resemblance whatever to those of the *Geotrupinae*.

In view of all the facts it seems to me that both *Pleocomma* and *Pachypus*, although by no means closely related, are probably more nearly related to each other than to any other known forms, and that, while they are best classed among the *Laparosticti*, they are scarcely less related to the *Pleurosticti*.

Prof. Kolbe has added to the Lamellicorn series the family *Synteliidae*, consisting of the small genus *Syntelia*, which he regards as forming a link with the Staphylinid series through the *Histeridae*. But the latter family is probably one of the latest branches of that series and *Syntelia* is in many respects by no means primitive. The antennae are of a well-developed Clavicorn type, and if there is any special relationship between the two great series, which is as yet very hypothetical, I think the *Synteliidae* are more naturally placed on the Staphylinid side. If I am right, however, in regarding the genera I have just discussed (those with many-lamellated antennae) as the most primitive Lamellicornia, then the ancestry of the series should probably be traced in quite another direction. I may point out, as of some significance, that the Lamellicornia are invariably characterized by having only a single articulated spine to the front tibia. In the *Synteliidae*, *Histeridae*, *Silphidae*, etc., there are two.

The following Table indicates what appear to me to be the primary subdivisions of the Laparostict *Scarabacidae*—

Antennal club of more than 3 joints.

Antennae 11-jointed	PLEOCOMINAE.
Antennae 8-jointed	PACHYPODINAE.

Antennal club of 3 joints.

(Labrum and mandibles horizontally extruded, flattened.

α Eyes divided in front.

Labrum as long as mandibles ACLOPINAE.

Labrum shorter than mandibles.

Antennae 11-jointed GEOTRUPINAE.

Antennae 10-jointed.

Antennal club telescopic, joints cupuliform

HYBOSORINAE.

Antennal club simple, lamellate.

Stridulating plate in hind coxal cavity

TAUROCERASTINAE.

Stridulating plate on hind coxa .

ORPHININAE.

Antennae 9-jointed CHIRONINAE.

α Eyes entire OCHODAEINAE.

) Labrum and mandibles not horizontally extruded.

o Antennae 10-jointed.

Labrum very small IDIOSTOMINAE.

Labrum large TROGINAE.

α Antennae 8- or 9-jointed.

Hind tibia 2-spined: mid-coxae contiguous APHODIINAE.

Hind tibia 1-spined: mid-coxae separate COPRINAE.

In this scheme of classification, most of the diagnostic characters introduced by Erichson and adopted by Lacordaire and all later systematists have been abandoned. The number of visible ventral segments in the abdomen was employed for a primary division by Erichson; and although both Lacordaire and Westwood remarked that it was scarcely of sufficient weight for the purpose, neither ventured to reject it, and the occurrence of five segments only has remained the criterion of the *Troginæ* and led to the wide separation of genera very nearly allied. The visibility or otherwise of the metasternal epimera, similarly used for the separation of the Laparostict sub-families, is, like the number of recognizable ventral segments, subject to gradual transition and no more capable of application as a sharp dividing line. My study has thus led to a certain fresh delimitation of frontiers and re-arrangement of the component genera of certain sub-families, especially the *Hybosorinæ* and *Troginæ*, which it is necessary to define.

Two genera, *Anaidcs* and *Chaetodus*, placed together in the *Trogidae* by Westwood, were separated by Lacordaire, and the second transferred to the *Hybosoridae*. *Phacochroops*, of Candèze, which has distinct affinities with both these genera, and in which the fusion of the ventral segments, regarded as characteristic of the *Hybosorinae*, reaches its maximum, is placed in the *Troginae* on account of the number of those segments externally visible. *Liparochrus* again, which has the faculty of folding the body so characteristic of the small *Troginae*, has the antennal club of the very different form found in the *Hybosorinae*, and the asymmetrical front claws of the male, which I believe are found in no other Laparostictids except the Hybosorine genus *Phacochrous*, also occur in *Liparochrus*. It is obviously unnatural to interpose between these closely-related genera the great groups of *Coprinae* and *Aphodiinae*, as proposed by Erichson, or even the *Geotrupinae*, as Lacordaire has done, and indeed in my opinion it is impossible to refer them to different sub-families.

The genus *Trox* is a peculiar and rather isolated one which, except in the form of the abdomen and elytra, has few points of resemblance to those mentioned above. In the structure of the head, antennae, organs of the mouth, prothorax, scutellum and legs it is entirely different. Its only near ally is *Cryptogenius*, a genus with a slight superficial resemblance to *Anaidcs*, of which the second known species is described at the end of this paper. The essential characters of the *Troginae* are also found in the curious contractile-bodied group of the *Acanthocerini*. The following genera, which have been assigned to the *Troginae*, I propose to transfer to the *Hybosorinae*, viz. *Liparochrus*, *Anaidcs*, *Phacochroops*, *Phacochridius* and *Pantolasius*.

These two sub-families are most easily grouped according as (1) the antennal club is simple, the head more or less angular in front, and the labrum and mandibles not extended horizontally (*Troginae*); or (2) the joints of the antennal club are cup-shaped and telescope one within the other, the head quadrate or elliptical in front, and the labrum and mandibles horizontal, flattened and plainly visible from above (*Hybosorinae*).

In the *Troginae* the first joint of the antenna is greatly enlarged, more or less bent, and usually projects

beyond the articulation with the second joint; the clypeus has a free edge all round, and the organs of the mouth are bunched together and not visible from above. The labrum is thick and more or less vertical, and the mandibles are stout and not projecting. The elytra are very ample, and the abdomen is always deeply sunk within them. The claws are simple and symmetrical, and the sexes are alike externally.

The *Hybosorinae* have the first joint of the antenna only slightly enlarged and of normal form, the club globular with the joints fitting one within the other. The clypeus is flat, not pointed, and not covering the labrum and mandibles, which appear to form a continuation of it. The labrum is transverse, and lies upon the base of the mandibles, which are exposed at the front and sides. The front tibiae are generally finely serrate along the outer edge, with three larger and sharper teeth. The claws are simple or toothed, and sometimes the front claws of the male are unsymmetrical. The two sexes often differ considerably.

Sub-family.—*HYBOSORINAE*.

Professor Kolbe has called attention to the absence of this group from the Australian region, but the inclusion of the genus *Liparochrus* supplies this deficiency. In addition to the genera I have already transferred to the group must be mentioned *Aporolaus*, of Bates, which is very closely related to *Dicraeodon*, Erichson, and indeed if other species are found it will probably be necessary to unite all under the latter name. "*Coelodes*, No. 2," of Bates, in the *Biol. Centr.-Americana*, is a species of *Dicraeodon*.

Hybosorus rufulus, described in a fragmentary manner by Castelnau, has always been an object of uncertainty. It was placed in the genus *Coelodes* in the Munich catalogue and in *Hapalonychus* by De Borre, who believed it to be identical with *H. Waterhousei*, Westw. I believe this to be right as regards the genus but not the species. I have examined female specimens from Haiti, determined, I think correctly, as *H. rufulus*, and associated with *H. Waterhousei*, of which only a single male from Cuba was described by Westwood. The other sex of that species I do not know, but the true male of *H. rufulus* is a very remarkable insect which has not

yet been described. Like the female it has head, prothorax and legs of a bright yellow colour and the elytra usually a little duller, but the claws have in the male a strong tooth near the middle, the labrum is larger, and the mandibles are broad and prominent, almost as in the males of *Phacochrous*. The front tibiae and tarsi are longer, and the tibiae have only two teeth instead of three. A very curious feature is the contraction of the hind tarsi, which are very short and thick. Finally, the hind tibiae bear at the end a tuft of very long hairs which actually extend beyond the tarsi. This curious genus is almost the only Lamellicorn genus which is apparently peculiar to the West Indian Islands.

The most salient characters of the *Hybosorinae* are frequently peculiar to the male, a fact unknown to Westwood, who relied chiefly upon these features in his synopsis of the genera (Trans. Ent. Soc. Lond., IV, 1847, p. 157). This is therefore useless and liable to mislead unless the sexual differences of the species under examination are known. As several recently described genera are yet unknown to me I cannot at present replace it with a fresh tabulation of the now much more numerous genera.

The genus *Phacochridius* consists of the two species *P. derausus*, Har., and *P. Haroldi*, Fairm., and the only character which has been mentioned as distinguishing it from *Phacochroops* is the existence of a transverse carina on the posterior tibiae. This is found in quite typical species of *Phacochroops* and therefore has no generic value; but there is a considerable difference in the shape of the pronotum, which is more or less quadrate in *Phacochroops*, while in *Phacochridius* there is no trace of hind angles, the margin forming a continuous curve from one front angle to the other. To this distinction may be added a peculiar sexual feature. In the female the puncturation of the elytra is interrupted on each side behind the scutellum, leaving a very conspicuous shining patch. I have found this constant in a considerable series of *P. Haroldi* from Batu I. in the Genoa Museum, and have ascertained by dissection that it is distinctive of the female sex. Harold described the same peculiarity as occurring in *P. derausus*, so that the type of that species is a female.

Hypscloclerus, of Fairmaire, from the description is evidently not a member of the *Hybosorinae*. It probably belongs to the *Troginae*.

The following new species belong to this sub-family—

Liparochrus dux, sp. n.

Ovatus, niger, nitidus, valde convexus, pectore pedibusque breviter fulvo-setosis; capite distincte punctato, clypeo sat parvo, lateribus rugoso-punctato; prothorace laevissimo, omnino marginato, postice lato, angulis rotundato, basi leviter sinuato, medio prominulo, lateribus latis, punctis nonnullis vage impressis, angulis anticis productis, rotundatis; elytris post medium amplissimis, postice paulo productis, impunctatis, stria profunda suturali, alia marginali parisque 4 interpositis, primo solum ad marginem anticam attingente; corpore subtus pedibusque subtiliter striolatis, tibiis anticis extus serratis, dentibus duobus majoribus:

♂, pedum anticorum dentibus 2 tibialibus minutis haud acutis, unguiculo interno valde inflecto, dilatato: ♀, pedum anticorum dentibus 2 tibialibus acutissimis. Long. 18 mm. Lat. max. 10 mm.

Hab. S.E. NEW GUINEA: Moroka (1300 m.), Paumotu R. (*Loria*, 1892-3). In the British and Genoa Museums.

This and the following species are remarkable for their great size, their dimensions being far larger than those of any other Hybosorinae known. *L. dux* appears to resemble *L. papuus*, Lansb. (with *L. alternatus*, Macl., and *L. sulcatus*, Montr., the only non-Australian species at present known). It is extremely smooth and shining, and the elytra are a little attenuated behind, decorated with deeply impressed striae in pairs and entirely devoid of punctures. The front tibiae have only two external teeth in addition to the usual close serration.

Liparochrus ingens,* Felsche, Deuts. Ent. Zeits., 1909, p. 764.

Nigro-piceus, nitidus, breviter ovatus, valde convexus, corpore subtus opaco, parce fulvo-setoso; capite subtiliter punctato, clypeo sat parvo; prothorace laevi, omnino marginato, extus minute punctato, lateribus bene arcuatis, angulis anticis productis, subacutis, posticis rotundatis, margine basali leviter sinuato; elytris sat brevibus, post medium latissimis, omnino sat irregulariter striatis, striis antice et latera versus vage punctatis, dorsi interstitiis partim tessellatis, pectore abdomineque crebre striolatis, opacis; tibiis anticis serratis, dentibus tribus majoribus:

* Just before going to press I have received Herr Felsche's description of this species, to which I had given another name. By the author's kindness I have been able to examine the type.

♂, pedum anticorum dentibus majoribus minus gracilibus, unguiculo interno valde inflecto, dilatato.

Long. 15-17 mm. Lat. max. 10-10.5 mm.

Hab. S. NEW GUINEA: Irupara, Ighibirei (*L. Doria*, July, August 1889-90).

In the British and Genoa Museums.

This species is closely related to the preceding one, but rather more globose and less black and shining. The elytra are more closely striated, and upon the dorsal part the alternate interstices, and all the interstices towards the apex are broken into short elevations and depressions which produce a tessellated appearance. The front tibiae are armed with three moderately sharp teeth in addition to the fine serration.

Liparochrus timidus, sp. n.

Niger vel piceo-niger, nitidus, late ovatus, capite transverse ruguloso, clypeo brevi, quadrato, antice laevissime emarginato; prothorace medio parcissime vix perspicue punctulato, lateribus modice dilatatis, haud crebre fere rugose punctatis, angulis anticis modice prominentibus, paulo rotundatis, posticis obtusis, scutello laevi, acuto; elytris profunde striatis striis geminatis, profundis, vix punctatis, interstitiis parcissime et minutissime punctulatis; tibiis anticis serratis, dentibus tribus magnis.

Long. 6.5-9 mm. Lat. max. 4.5-5.5 mm.

Hab. NORTH AUSTRALIA: Alexandria (Oct. to March).

A series of specimens collected by Mr. W. Stalker have been presented by Sir W. Ingram to the British Museum.

It is a black, globose and very shining species with the head rugose, the pronotum very finely and thinly punctured, and the elytra furnished with several pairs of deeply incised, not distinctly punctured striae, the interstices thinly and irregularly sprinkled with minute punctures. The shape and general appearance are as in *L. geminatus*, Westw., but *L. timidus* is larger on the average, and a little more elongate, with the pronotum much smoother and the elytra more deeply striated and more sparingly punctured.

The described species of the genus *Cocloces*, with the exception of *C. castaneus*, Westw., and *C. nigripennis*, Arrow, have the elytra punctured in double rows, with wide,

smooth intervals. The two following new species have them evenly punctured all over.

Coelodes fumipennis, sp. n.

Rufo-testaceus, elytris minus laetis, marginibus omnibus late et vage fumatis: subglobosus, capite fere laevi, clypeo leviter rugosulo; prothorace toto impunctato, lateribus fere rectis, baseos medio laevissime prominente; elytris undique sat regulariter seriato-punctatis, stria suturali profunda, punctata:

♂, prothorace antice laevissime impresso, marginis antici medio subacuminato.

Long. 6 mm. Lat. max. 4 mm.

Hab. AMAZONS: Para, Ega (*H. W. Bates*). British Museum.

This is easily recognized not only by the uniform fine puncturation of the elytra, but by its rather peculiar colouring, the head, prothorax, legs and lower surface being bright orange-testaceous, while the elytra are almost of the same colour in the middle of the back, but change imperceptibly to a smoky black at the margins.

Coelodes punctipennis, sp. n.

Laete testaceus, prothorace interdum paulo dilutiore, modice elongatus; capite rugosulo, postice medio laevi; prothorace impunctato, lateribus leviter arcuatis; elytris undique fortiter et regulariter seriato-punctatis, stria suturali profunda punctata:

♂, capitis vertice leviter transverse carinato; prothorace antice sat late impresso, marginis antici medio subacuminato.

Long. 5.5-6.5 mm. Lat. max. 3.5-4 mm.

Hab. ECUADOR: Canelos, Mirador (*Buckley*); Peru: Nauta (*H. W. Bates*).

This is more brightly coloured than *C. castaneus*, Westw., and the elytra are very strongly and uniformly punctured, whereas in Westwood's species they are very feebly and irregularly punctured.

Chaetodus exaratus, sp. n.

Rufo-piceus, nitidus, supra leviter cupreo-micans, longe ovatus, ubique parce sat fortiter ferrugineo-setosus; capite parce punctato, clypeo parvo elliptico; prothorace nitidissimo, marginibus antica

et lateralibus fortiter punctatis, disco utrinque parce et grosse punctato, angulis anticis acutis, posticis paulo arcuatis; elytris postice paulo productis, profunde striatis, striis pone partem anticam multo divisis, tenuissimis, interstitiis angustatis, carinatis, parcellis setiferis, corpore subtus minutissime striolato.

Long. 8-8.5 mm. Lat. max. 4.5 mm.

Hab. BRAZIL: Rio de Janeiro.

This is a rather large, slightly metallic species, very distinct from those hitherto described. The elytra are rather drawn out behind, so that the body does not appear broadly rounded there, and the striation is very close and deep. The striae are simple in the anterior part, but become broad and multiple, so that the interstices are narrowed to carinae, upon which are placed scanty hairs at intervals.

The British Museum collection contains, besides a specimen taken at Rio de Janeiro by the late Alexander Fry, one from Dejean's collection labelled *Adelops striatus*, Brazil: Sommer. It is quite different from *Chaetodus striatus*, de Borre.

Phaeochroops peninsularis, sp. n.

Longe pyriformis, fusco-brunneus, ubique longe rufohirtus; capite crebre et grosse punctato, clypeo parum elongato; prothorace dense et aequaliter sat grosse punctato, absque linea mediana laevi, antice angusto, angulis anticis acutis, lateribus postice leviter arcuatis, basi quam elytris ad humeros sensim angustiore; elytris sat subtiliter annulato-punctatis, utroque obsolete 3-costato, marginibus longe et dense ciliatis; tibiis anticis toto serratis, longe 3-dentatis, posterioribus sat gracilibus, haud carinatis; tarsis quam tibiis multo brevioribus.

Long. 13-14 mm. Lat. max. 7.5 mm.

Hab. MALAY PENINSULA: Perak (*W. Doherty*).

One specimen of each sex was taken by the collector.

It is a species extremely close to *P. gigas*, Arrow, and when describing that species I regarded them as identical. It is a little smaller, and the tarsi are noticeably shorter relatively, at least in the male, in which sex they are a little longer than in the female. The pronotum is rather more densely punctured, less shining, and without a smooth longitudinal line along the middle. Its sides are a little more rounded and very slightly incurved beyond the middle, so that the base is a little narrower than in

P. gigas. The prothorax and elytra have long marginal fringes of tawny hairs.

Phacochroops opacicollis, sp. n.

Longe pyriformis, fusco-brunneus, rufo-hirtus, elytris nitidis; capite dense punctato, clypeo sat brevi, prothorace densissime minute aequaliter punctato, erecte piloso, lateribus antice rectis, angulis acutissimis, postice subtiliter curvatis et late marginatis, angulis sat distinctis, basi ad elytrorum latitudinem (ad humeros) aequali, elytris sat longis, crebre punctatis, singulo obsolete 3-costato, costis breviter setosis, marginibus longe rufo-ciliatis, tibiis anticis minute serratis, longe 3-dentatis, posterioribus haud carinatis, tarsis sat gracilibus.

Long. 15 mm. Lat. max. 7.5 mm.

Hab. TENASSERIM: Plapoo, Mt. Mooleyit (*L. Fea*, April 1887).

In the British and Genoa Museums.

This species is like *P. peninsularis* and *gigas*, but a little more elongate and with a less conspicuous hairy clothing. The prothorax is exceedingly densely punctured and clothed with closer but shorter hairs, its sides being nearly straight, with a smooth shining margin, the posterior half of which is rather broad. The elytra are well punctured but very shining, and each has three slight costae which bear fine hairs. The lateral edges of both prothorax and elytra are furnished with long and close fringes. The legs are slender.

Phacochroops vulpecula, sp. n.

Pyriformis, fusco-brunneus, longe rufo-hirtus; capite fortiter punctato, clypeo sat longo; prothorace fortiter et aequaliter punctato, lateribus bene arcuatis, vix marginatis, angulis anticis acutis, posticis fere rectis, minute rotundatis; elytris modice nitidis, undique sat crebre annulato-punctatis, singulo leviter 3-costato, longe sat parce hirto, lateribus externis haud dense ciliatis, tibiis anticis sat grosse serratis et acute 3-dentatis, dente supero paulo retro-instructo, tibiis posterioribus haud carinatis.

Long. 12-13 mm. Lat. max. 6.5-7.5 mm.

Hab. MENTAWEI IS.: Sipora (*E. Modigliani*, May and June 1894).

In the British and Genoa Museums.

P. vulpecula is extremely close to *P. peninsularis*, Arrow, but the clypeus is longer and coarsely, but not rugosely,

punctured, the pronotum is rather more evenly and densely punctured, and the fringe of hairs at the sides of the elytra is considerably longer and thicker.

Phaeochroops rattus, sp. n.

Pyriformis, fusco-brunneus, sat breviter fulvo-hirtus; capite grosse fere rugose punctato, clypeo parvo, oculis prominentibus, laevibus; prothorace densissime punctato, transverso, lateribus vix curvatis, angulis omnibus acutis, posticis ad humeros exacte coadaptatis; elytris modice nitidis, fortiter fere confuse punctatis, singulo leviter anguste 3-costato et ad marginem internam magis elevato, marginibus externis vix ciliatis; tibiis anticis extus toto minutissime serratis et acute 3-dentatis, posterioribus medio obsolete carinatis; tarsis quam tibiis paulo brevioribus.

Long. 10 mm. Lat. max. 5.5 mm.

Hab. SUMATRA: Setinjak (1800 ft.), Si-Rambé (*E. Modigliani*, Dec. to March).

In the British and Genoa Museums.

Two specimens were found by the late Mr. Ericson in the first locality during January 1898, and a series was collected in the second by Sig. E. Modigliani from December 1890 to March 1891. It is a small species, with shorter and scantier pubescence than usual, and without lateral fringes to the prothorax and elytra. The clypeus is small and the eyes prominent, very finely faceted and shining, with the antecular ridges well developed and not very oblique. The prothorax is relatively rather short, the sides nearly straight behind, and the base rather broad, with prominent hind angles. The elytra are rather more coarsely punctured than in the other species. The legs are moderately slender and fringed, but not thickly, with short hairs.

Phaeochroops niasianus, sp. n.

Pyriformis, nigro-fuscus, parcissime setulosus; capite grosse punctato, clypeo parvo, oculis magnis, nitidis; prothorace brevi, dense et grosse punctato, lateribus postice laevissime arcuatis, angulis anticis acutis, posticis minute obtusatis, elytris dense, fere rugose punctatis, punctis haud profundis, singulo elytro leviter 3-costato, marginibus vix ciliatis.

Long. 9-10 mm. Lat. max. 5 mm.

Hab. NIAS I. (*H. Raap*, 1897-1898).

In the British and Genoa Museums.

This is closely similar to *P. rattus* and *P. batuensis*, but generally rather darker in colour, and distinguishable by the rather larger and more distinct punctures with which the pronotum is covered. It is also smaller than *P. rattus* and larger than *P. batuensis* and differs from the former by its very shining and finely faceted eyes and the more rounded sides of the pronotum, and from the latter by the finer and less deep puncturation of the elytra.

Phacochroops batuensis, sp. n.

Pyriformis, fusco-rufus, haud dense fulvo-hirtus; capite grosse punctato, oculis nitidis, prothorace brevi, dense punctato, lateribus postice laevissime arcuatis; elytris grosse et profunde rugose punctatis, singulo lineis tribus longitudinalibus vix elevatis instructo, marginibus vix ciliatis.

Long. 8-9 mm. Lat. max. 4-5 mm.

Hab. BATU I. (*H. Raap*, 1896-1897).

In the British and Genoa Museums.

This is extremely close to *P. niasianus*, but a little smaller on the average and a shade lighter in colour, with longer and more evident pubescence upon the upper surface. The punctures of the prothorax are more numerous and those of the elytra deeper and rougher.

Phacochroops mentawaiensis, sp. n.

Pyriformis, fusco-brunneus, sat parce fulvo-setosus; capite rugose punctato, clypeo brevi, oculis haud nitidis, grosse granulatis, prothorace brevi, dense punctato, postice lato, lateribus vix arcuatis, angulis posticis prominentibus; elytris dense et rugose punctatis, singulo lineis tribus longitudinalibus vix elevatis instructo, marginibus vix ciliatis.

Long. 9 mm. Lat. max. 5 mm.

Hab. MENTAWAI Is.: Sipora (*E. Modigliani*, May and June 1894).

In the British and Genoa Museums.

This species is at first sight exactly like *P. niasianus*, but the eyes are more coarsely faceted and not glossy, the clypeus is more finely and rugosely punctured, and the elytra are more coarsely and rugosely sculptured, with rather sharper costae.

Phaeochrous dissimilis, sp. n.

Piceo-niger, ore pedibus, prothoracis et elytrorum marginibusque brunnescentibus, abdomine ferrugineo; capite crebre punctato, prothorace nitido modice punctato, lateribus grosse et crebre punctatis, elytris crebre punctatis, seriebus tribus longitudinalibus regulariter quadristriato-punctatis, interstitiis crebre confuse punctatis :

♂, multo major, mandibulis modice prominentibus, rotundatis, capite subnitido, prothoracis lateribus latissimis, confluer punctatis, elytris opacis, parte antica angusta nitida; lateribus cum pedibus longe rufo-hirtis, tibiarum anticarum dente supero minuto :

♀, sat nitida, capite rugoso, tibiis anticis fortiter 3-dentatis et serratis.

Long. 13-16 mm. Lat. max. 7.5-8.5 mm.

Hab. TENASSERIM, Mouhmein (*L. Fca*, May 1887).

In the British and Genoa Museums, and M. René Oberthür's collection.

This is the largest species of *Phaeochrous* I have seen, and the disparity between the sexes, always considerable in this genus, is very remarkable. The anterior half of the upper surface of the male is shining, and the posterior half (*i. e.* the whole of the elytra except a narrow anterior strip) entirely dull and sooty. The female is shining above and beneath, except upon the head, which is rugose. The elytra (in both sexes) are finely and densely punctured, and each has three longitudinal bands composed of four straight lines of punctures. The colour is rather dark with the abdomen reddish.

The claws of the male are blunt, with the basal appendage inconspicuous and the tooth of the outer claw reaching beyond the middle.

A similar sexual difference in the elytra is found in a West African species, *Phaeochrous dispar*, Qued.

Phaeochrous pallidus, sp. n.

Laete ferrugineus, sat parvus, prothorace distincte haud dense punctato, elytris fortiter et aequaliter crebre striato-punctatis, haud costatis :

♂, mandibulis latis, prominentissimis, capite nitido, modice punctato, tibiis anticis latis, tridentatis, dente tertio minuto, margine supra leviter crenulato, haud distincte serrato :

♀, capite fortiter rugose punctato, elytrorum interstitiis minute sat parce punctulatis.

Long. 9-10 mm. Lat. max. 4-5 mm.

Hab. SOUTH MYSORE: Nilgiri Hills (*H. L. Andrewes, Sir G. F. Hampson*); CEYLON.

Type in the British Museum.

P. pallidus is very much like *P. emarginatus*, Cast., but is of a bright mahogany colour and rather smaller than the normal size of that species. The pronotum is moderately sparsely punctured and the elytra finely and closely striate-punctate, with the intervals not elevated. In the males the front tibiae are rather broad and indistinctly serrate before and after the minute uppermost tooth, only three or four serrations being distinguishable above it. The mandibles are a little broader and more prominent than in *P. emarginatus*. In our single female specimen the elytra are very finely but distinctly punctulated in the interstices.

Phaeochrous arabicus, sp. n.

Piceus vel rufo-piceus, modice nitidus; capite crebre prothorace parce sed distincte punctato, elytris crebre striato-punctatis antice sat regulariter, postice confusus;

♂, mandibulis prominentissimis antice omnino arcuatis, tibiis anticis tri-dentatis, forcipis lobo dextro lanceolato, modice acuto, lobo sinistro lato, fere quadrato.

Long. 9-11 mm. Lat. max. 5-6 mm.

Hab. ARABIA: Yemen (*Millingen*). British Museum.

This species was contained in the bequest of the late Alexander Fry. It is intermediate between the Oriental and African groups, the elytra in the first being striate, while in the second they are more or less irregularly punctured. In *P. arabicus* the elytral punctures are arranged in longitudinal rows, some of which are lightly impressed, but towards the apices they become broken up.

Phaeochrous nitidus, sp. n.

Nigro-piceus, nitidus, ore, pedibus, corporeque subtus ferrugineis; prothorace irregulariter punctato; elytris creberrime confuse punctatis, punctorum seriebusque tribus longitudinalibus quadruplice instructis, tibiis anticis tridentatis et sat minute serratis:

♂, mandibulis prominentibus, capite fortiter punctato, prothorace haud late marginato, lateribus antice modice arcuatis; forcipis lobo dextro anguste lanceolato, haud distorto, sinistro brevi, basi vix dentato.

Long. 10.5-12 mm. Lat. max. 6-6.5 mm.

Hab. GERMAN E. AFRICA: Masailand, Kilimanjaro.

In the British Museum.

P. nitidus is another species very difficult to distinguish from *P. Beccarii*, but the puncturation is a little finer and the surface therefore rather more shining. The form also appears to be a trifle more elongate. In the male the prothorax is a little less dilated, the sides rather more rounded in front and less divergent behind. The examination of the genitalia, however, is the only means of discrimination which I have found really conclusive. To facilitate comparison I give here a short description of this part in the male of *P. Beccarii*, Har., of which by Dr. Gestro's kindness I have been able to examine the original specimens:—

Forcipsis lobo dextro longo, paulo contorto, apice lanceolato, basi paulo inflato, lobo sinistro sat brevi, basi fortiter dentato.

Phaeochrous mashunus, sp. n.

P. madagascariensis, Péring. (*nec* Westw.), Trans. S. Afr. Phil. Soc., 1900, p. 497.

Nigro-piceus, parum nitidus, ore, pedibus, corporeque subtus ferrugineis; prothorace sat distincte irregulariter punctato; elytris punctorum seriebus tribus longitudinalibus quadruplice instructis, interstitiis creberrime confuse punctatis, tibiis anticis tridentatis et sat minute serratis:

♂, mandibulis antice prominentissimis, subtruncatis, capite sat leviter punctato, prothorace sat late marginato; forcipsis lobo dextro breviter lanceolato, acutissimo, sinistro latissimo, basi minute dentato.

Long. 11·5-12·5 mm. Lat. max. 6-6·5 mm.

Hab. MASHONALAND: Salisbury (*G. A. K. Marshall*); NYASALAND (*Thelwall*).

Mr. Peringuey has described this under the name of *P. madagascariensis*, but although very like that (and all the species of *Phaeochrous* are extraordinarily alike) it still more closely resembles *P. Beccarii*, Har. It is a little smaller than the Madagascan species, and the puncturation is less fine and regular. From *P. Beccarii* it is distinguishable by the less distinct quadruple rows of punctures upon the elytra, which are a little more shining in the male. The mandibles in that sex are also more prominent and more quadrate externally.

Phaeochrous amplus, sp. n.

Ferrugineus, latus, sat nitidus, capite fortiter, prothorace distincte, punctatis; elytris crebre et toto irregulariter punctatis, absque lineis longitudinalibus distinctis:

♂, mandibulis haud prominentissimis, tibiis anticis distincte tridentatis; forcipis lobis duobus productis, dextro acuto, sinistro obtuso.

Long. 10-12 mm. Lat. max. 5.5-6.5 mm.

Hab. CAMEROONS: Mundame (*R. Rohde*). In the British Museum and German Entomological National Museum.

This is closely related to *P. gambiensis*, Westw., but both sexes are more shining, more strongly punctured on the head and thorax, and without smooth longitudinal lines upon the elytra. The male is a little broader, and the front tibiae, which in *P. gambiensis* have only two front teeth, are distinctly tridentate.

Phaeochrous camerunensis, sp. n.

Piceus, vel rufo-piceus, fere nitidus, capite prothoraceque ubique leviter punctatis; elytris fortiter irregulariter punctatis, lineis distinctis longitudinalibus, antice elevatis:

♂, mandibulis prominentissimis, tibiis anticis acute bidentatis; forcipis lobo dextro longo, contorto, apice acutissimo, uncinato, lobo sinistro brevissimo, lato.

Long. 10-12 mm. Lat. max. 5-6 mm.

Hab. CAMEROONS: Mundame (*R. Rohde*).

In the British Museum and the German Entomological National Museum.

It is rather darker-coloured and less broad than the previous species, with the head less punctured and the elytra more coarsely punctured, with distinct longitudinal lines, which are slightly elevated in front. It is exceedingly like *P. mashunus*, but a little less shining, less coarsely punctured, and the front tibia of the male has only two sharp teeth, as in *P. gambiensis*, Westw.

Phaeochrous thomensis, sp. n.

Rufus, capitis vertice elytrisque piceis, sat nitidus; capite prothoraceque parce punctatis, elytris sat crebre punctatis, lineis longitudinalibus modice distinctis:

♂, mandibulis prominentibus, subcircularibus; tibiis anticis

distincte 3-dentatis; forcipis lobis longitudine subaequalibus, dextro lanceolato, basi paulo inflato, sinistro obtuso.

Long. 10-11 mm. Lat. max. 6 mm.

Hab. W. AFRICA: ST. THOMÉ I., Vista Alegre (*L. Fea*, Oct. 1900). In the British and Genoa Museums.

This is another rather bright and shining species close to *P. amplus*, but less broad, with darker and less finely and uniformly punctured elytra.

Hybochaetodus, gen. nov.

Corpus breviter ovatum, convexum. Oculi haud prominentes, de supra visi vix perspicui. Clypeus semicircularis, fere ut latus quam caput. Labrum breve, porrectum, transversum. Mandibulae porrectae, falciformae, extus obtuse angulatae, apicibus acutis. Antennae breves, sat crassae. Prothorax lateribus arcuatus. Scutellum minutum, vix perspicuum. Corpus subtile grosse striolatum. Pedes haud longi. Tibiae anticae 3-dentatae, supra serratae.

Hybochaetodus obscurus, sp. n.

Niger vel piceus, capite pronotoque obscure cupreis, his grosse sat crebre punctatis, pronoti medio leviter sulcato, ante marginem posticam late et profunde triangulariter impresso, lateribus regulariter arcuatis, angulis anticis acutis, posticis obsoletis, singulo elythro carinis angustis circa 13 praebentibus, 4°, 7°, 10° et 13° paulo magis elevatis, integris, reliquis plus minusve interruptis, tibiis anticis acute 3-dentatis, supra serratis.

Long. 8 mm. Lat. max. 4 mm.

Hab. PERU: Vilcanota.

Two specimens were contained in the Berlin Entomological Museum, one of which has been presented to the British Museum.

The genus is a well-marked one allied to *Chaetodus*, but more ovate and not setose. The scutellum is much reduced and covered by the pronotum when the latter is not drawn forward. The mandibles are large and very acute, and when the tips meet a gap is left between mandibles and labrum. The pronotum is very strongly punctured and has a deep pit just before the base. The elytra are opaque and closely carinate, each third carina being very slightly more regular and pronounced than those intervening.

Sub-family.—*TROGINAE*.

I have said above that the only genus with any close relationship to the well-known and widespread genus *Trox* is *Cryptogenius*, known only by a single rare species. That species, *C. miersianus*, Westw., inhabits Colombia. A second species is here described which has been found in Brazil.

Cryptogenius Fryi, sp. n.

Fusco-brunneus, haud nitidus, angustus, sat depressus, undique grosse sat parce setosus; capite rugoso; prothorace crebre punctato, lateribus valde rotundatis, serratis, post medium abrupte inflexis, angulis posticis acutis, baseos medio obtuse angulato, elytris longitudinaliter strigose vermiculato, tuberculis paucis seriatim instructis, carina acuta integra laterali aliaque interna vestigiali antica, lateribus obsolete serratis; pedibus sat longis, femoribus anticis subtus fortiter mucronatis, tibiis omnibus serratis.

Long. 7.5 mm. Lat. max. 4 mm.

Hab. BRAZIL: Petropolis.

A single specimen was found in October 1851, by the late Alexander Fry.

This species has nearly the same size and shape as *C. miersianus*, but is a little shorter relatively, not so dark in colour (which may be only individual), and more finely and closely sculptured. There is a slight coppery lustre upon the femora and the front margin of the prothorax. The most remarkable feature is the very strong hooked tooth situated at the middle of the lower edge of the front femur and pointing outwards. The pronotum is very coarsely and closely punctured, and has not the strong oblique carinae of *C. miersianus*, and the elytra are entirely covered with fine irregularly broken up longitudinal striations.

It will perhaps not be out of place to record here that *Trox trisulcatus*, Curtis (Chili), of which the type is in the British Museum, is the very common and widespread species *T. scaber*, L.

Sub-family.—*IDIOSTOMINAE*.

I formed this sub-family in 1904 for a single new genus of which two species were described, both inhabitants of

Southern Patagonia. It appears that this curious group of beetles ranges over a much larger area of South America and perhaps contains many species. Two or three have been already described and placed in different genera of *Dynastinae*, a group to which, as I pointed out, they have a superficial resemblance. It will be useful to bring together the references, which are as follows—

Genus *IDIOSTOMA*, Arrow, Trans. Ent. Soc. Lond., 1904, p. 740.

Landbecki, Phil. (*Oryctes*), Stett. Ent. Zeit., 1873, p. 309, Pl. II, fig. 2; Anal. Univ. Santiago, 1887. Chili.

syn. *Paulseni*, Fairm. (*Phyllognathus*), Bull. Soc. Ent. France, 1885, p. 189.

Mcdon, Arrow, *l.c.* p. 741. Patagonia.

rufum, Arrow, *l.c.* S.W. Patagonia.

simplicifrons, Fairm. (*Phyllognathus*), *l.c.* Peru.

The two species of Fairmaire are very inadequately described, but M. Germain has stated that *I. Paulseni*, Fairm., and *I. Landbecki*, Phil., are identical, and that they belong to a new genus of *Orphnidae*. I have not seen M. Germain's paper, owing to the Chilian periodical not reaching this country, but my friend Dr. Ohaus has kindly given me this information and has also sent me for comparison with our specimens an example of *I. Landbecki* found by himself at San Isidro, Chili. It closely resembles *I. rufum*, but is rather more elongate and much less strongly punctured, while the maxillae have distinct inner and outer lobes, the inner one very short and both fleshy and unarmed.

Sub-family.—*ACLOPINAE*.

Only two genera of this peculiar group are known, *Aclopus*, containing two South American species, and *Phaenognatha*, containing one species from North Australia, to which Dr. Heller has recently added another from Argentina. This is not very similar superficially, but is so close in all essential points that, although a genus might well have been made for it, there is no incongruity in the course which Dr. Heller has preferred, while the interesting geographical distribution of these forms, supplying another instance of the special relationship of the Australian to the South American fauna, is emphasized.

In the British Museum there is a specimen of another Argentine species, not in sufficiently good condition for description, and a careful examination of all the Australian examples of *Phaenognatha* I have been able to bring together has led me to distinguish six species, all of which are now represented in the National collection. The species of *Aclopus* are still more numerous, but specimens in good condition are rare. I have described only one new species.

In comparing the mouth parts of *P. Jenseni* with those of *P. Erichsoni*, Hope, Dr. Heller has relied upon Westwood's figures, which are not in every particular accurate. The last joint of the maxillary palpus is not shorter than the preceding joint, but distinctly longer, as it is in *P. Jenseni*. The *Phaenognatha* from Rockhampton examined by Dr. Heller is not Hope's species but *P. aequistriata*, one of the forms here described.

The body is rather soft and plastic in these beetles, and owing to their rarity it is difficult to determine what features are most constant and significant from the systematic point of view. The genitalia are little chitinized and of very simple form, affording no assistance in the discrimination of the species. I have already mentioned that males only have so far been found, and so few of these exist in European collections that no satisfactory systematic study is yet possible. It is to be hoped that closer investigations by collectors will soon enable the present rather tentative survey to be superseded.

The following short diagnosis of the typical species is drawn from the type specimen in the Oxford Museum.

Phaenognatha Erichsoni, Hope.

Trans. Ent. Soc., Vol. IV, 1845, p. 113, Pl. VI, fig. 5.

Testaceo-rufa, elytris, margine antico excepto, nigris; corpus sat latum, clypeo prope marginem anticum cornu recurvato apice acuminato armato, prothorace lato, elytris sat brevibus, postice valde attenuatis, profunde geminato-striatis, striis punctatis, interstitiis alternis latis, irregulariter punctatis, apicibus intus subangulatis, tarsis posticis longissimis, unguibus minutis.

Long. 15 mm. Lat. max. 8-9 mm.

Hab. NORTH AUSTRALIA: Port Essington.

TRANS. ENT. SOC. LOND. 1909.—PART IV. (DEC.) L L

There is a second specimen of this species in the British Museum, taken by the ornithologist, Gould, at the same time as the Oxford example.

Phaenognatha angusta, sp. n.

Testaceo-rufa, elytrorum dimidio posteriore nigro; corpus sat angustum, fulvo-hirtum, clypei medio cornu bicuspidato armato, prothorace quam elytris paulo latiori, antice late fossato et fulvo-hirto, elytris sat longis, valde attenuatis, dorso profunde geminato-striatis, striis punctatis interstitiis alternis latis, irregulariter punctatis, tarsis posticis longissimis, subtus sat dense hirsutis, unguibus minutis.

Long. 14.5-16 mm. Lat. max. 8 mm.

Hab. N. QUEENSLAND.

This species has been confused with *P. Erichsoni* in the British Museum and other collections. It differs from it in the following particulars. It is narrower in shape, and the black patch is restricted to the hinder half of the elytra. The cephalic horn is placed at a distance from the margin of the clypeus, and is narrow, parallel-sided and two-cusped at the end.

Phaenognatha tristis, sp. n.

Nigra, nitida, corpore paulo elongato, subtus dense fulvo-hirto, clypeo prope marginem anticum cornu recurvato, sat lato, apice acuminato, armato; prothorace lato, antice late retuso et fulvo-hirsuto; elytris postice valde attenuatis, profunde geminato-striatis, interstitiis alternis latis, omnino irregulariter crebre punctatis; tarsis posticis longissimis, sat dense fulvo-pubescentibus, pilis decumbentibus, unguibus minutissimis.

Long. 17-19 mm. Lat. max. 9-10 mm.

Hab. N. QUEENSLAND: Mein.

This is the largest species I have seen of the genus. In addition to its size and dark colour, it differs from *P. Erichsoni*, which it most resembles, by its elytra being more produced behind. The hind tarsi are very long and thickly hairy. As in *P. Erichsoni*, the cephalic horn is produced to a point and the elytral striae are very distinctly paired, with the intervening spaces broad and strongly punctured.

Phaenognatha aequistriata, sp. n.

Testaceo-rufa, elytrorum apicibus nigris, corpore sat lato, subtus fulvo-hirto; clypei medio cornu brevi, apice truncato aut bicuspidato, armato; prothorace latissimo, antice leviter fere semicirculariter depresso et fulvo-hirsuto; elytris sat latis, postice modice attenuatis, profunde punctato-striatis, interstitiis fere aequalibus, subsuturali et humerali irregulariter punctatis; tarsis posticis longissimis, articulis longe erecte setosis, unguibus minutis.

Long. 15-16 mm. Lat. max. 8-9 mm.

Hab. QUEENSLAND. (Simson.)

A small specimen of this species in Herr Felsche's collection is from Rockhampton and another from Mackay.

This species has almost the same shape as *P. Erichsoni*, and the coloration of *P. angusta*. The cephalic horn is very short, tapering but not acuminate, and placed at a distance from the clypeal margin. The pubescent depression at the front of the pronotum is very slight, not wide, and its hind margin is not sharply defined. The elytra are rather broad, the striae nearly equidistant and the subsutural and humeral interstices irregularly, but not very strongly, punctured, and the intervening interstices not or scarcely punctured. The hind tarsi are very long, each joint having at its extremity a cirlet of long outstanding bristles, and the claws are not quite as small as in *P. angusta* and *Erichsoni*.

Phaenognatha scutellata, sp. n.

Rufo-castanea, scutello fere nigro elytris que testaceis, apicibus vage infuscatis, capite corpore que subtus sat longe fulvo-hirtis; capite omnino rugoso, lato, oculis parvis, sat distantibus, clypeo prominente, cornu a margine remoto, brevi, angusto; prothorace quam elytris vix latiore, lateribus irregulariter punctato, medio fere laevi, antice paulo retuso et pubescente; elytris profunde striatis, striis vage punctatis, interstitiis aequalibus, subsuturali et humerali irregulariter punctatis; tarsis posticis quam tibiis duplo longioribus, articulis extremitate setis longis instructis, unguibus gracilibus, longitudine vix ad articuli ultimi dimidium aequalibus.

Long. 10-11.5 mm. Lat. max. 5.5-6.5 mm.

Hab. QUEENSLAND.

The type specimen has been kindly presented to the National Collection by Mr. B. G. Nevinson, who has a

second example. It is a small species, similarly coloured to *P. Erichsoni*, but the scutellum is black, and the black apical patches of the elytra fade quite gradually in front. The horn upon the head is slender and distant from the front of the clypeus. The labrum is very prominent but not pointed, and the mandibles are rounded at the sides. The elytra are moderately broad at the shoulders and taper to the extremities. They are marked with deep and almost equidistant striae, and the subsutural and humeral intervals are slightly punctured. The hind tarsi are twice as long as the tibiae, the joints are circled with long, stiff, outstanding bristles, and the claws are moderately long but less than half the length of the claw-joint.

Phaenognatha pusilla, sp. n.

Nigra, vel piceo-nigra, supra nitida, capite corporeque subtus longe haud dense fulvo-hirtis; capite lato, oculis parvis, sat distantibus, clypeo prominente, granuloso, cornu postico, brevi, acuminato, a margine remoto; prothorace quam elytris vix latiore, undique irregulariter punctato, antice paulo retuso et dense pubescente; elytris profunde striatis, interstitiis subsuturali et humerali punctis nonnullis instructis; tarsis posticis quam tibiis duplo longioribus, articulis extremitate setis longissimis instructis, unguibus sat longis, gracilibus, longitudine ad articuli ultimi dimidium aequalibus.

Long. 8.5-10 mm. Lat. max. 5-6 mm.

Hab. N. AUSTRALIA: Alexandria (*W. Stalker*).

Two specimens have been presented to the Museum by Sir William Ingram.

It is a uniformly dark species. The eyes are rather small and distant and the cephalic horn is short and sharp and situated considerably behind the front margin of the clypeus. The labrum is narrow, rounded at the apex and not tapering, and the mandibles are uniformly curved externally and not sinuated. The anterior depression of the pronotum is divided in the middle by a slight longitudinal carina and the elytra are not long, moderately convex and deeply striated, the striae very coarsely but indistinctly punctured and the interstices smooth except the subsutural and humeral ones, which bear a few irregular punctures. The middle and hind tarsi are about twice the length of the tibiae, the claws are moderately long (more than half the length of the claw-joint), and the

tarsal joints have each a circle of outstanding bristles at the extremity, each bristle as long as the joint.

Aelopus robustus, sp. n.

Niger vel nigro-piceus, elongatus, robustus, femoribus tibiisque crassis, tarsis modice gracilibus; capite parvo, vertice late arcuatim impresso et confuse punctato, clypeo fere quadrato, grossissime punctato, labro sat lato, margine incrassato; prothorace haud longo, sat parce punctato; elytris convexis, fortiter crebre punctatis, postice attenuatis, lateribus arcuatis, costa suturali crassa; tibiis brevibus, anticis fortiter bidentatis, posterioribus dilatatis, tarsis sat longis, setis haud erectis.

Long. 10-11.5 mm. Lat. max. 4-5 mm.

Hab. RIO DE JANEIRO: Cantagallo; BAHIA.

One specimen in the British Museum was taken by the late Mr. A. Fry at Cantagallo, and Herr Felsche possesses two examples from Bahia.

It is a large, strongly-built species, and distinguished, in addition to its colour, by its short and flattened posterior tibiae and not excessively long tarsi. The elytra are more strongly punctured, more rounded at the sides and more tapered behind than in *A. brunneus*, Er., the clypeus is larger and rather rectangular, with a broad thickened margin, and the labrum is broad and has a similarly thickened anterior margin.